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The European GreenBuilding Projects Catalogue June 2010 – October 2011

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2012

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Presentation

The goal of substantially improving end-use energy efficiency and promoting the use of renewable energy sources is a key component of the EU energy and environmental policies, shared by all EU Member States. The European Commission Directorate General Energy and Transport contributes to this goal through a series of actions under the "Intelligent Energy - Europe" Programme. In addition, given the large share of energy consumption in buildings and the large cost effective energy saving potential, special attention has been dedicated to the building sector. To this end a major step forward is represented by the Directive 2002/91/EC on the Energy Performance of Buildings.

The GreenBuilding Programme (launched in January 2005) is one of these actions, aimed specifically at private and public non-residential buildings.

The GreenBuilding Programme is a European Commission voluntary programme through which non-residential building owners and occupiers, being private or public organisations, are aided in improving the energy efficiency and to introduce renewable energy sources into their building stock. Any enterprise, company or organisation (hereinafter defined as “organisation”) planning to contribute to the GreenBuilding Programme objectives can participate.

This document describes some of the projects implemented by GreenBuilding Partners in the period June 2010 to October 2011. The projects have been implemented in different types of buildings, such as office buildings, schools, hotels, shopping mall, etc. Both new construction and the refurbishment of existing buildings are covered by the report.

Additional information on the goals and the results of the GreenBuilding programme, as well as the current Partner’s list and the list of the National Contact Points can be founded in the GreenBuilding Programme website at:

http://re.jrc.ec.europa.eu/energyeffiency/greenbuilding/index.htm.

Paolo Bertoldi

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Aberdeeen Property Nordic Fund 1 SICAV

Apoteket 9

Stora Torget 4, Linköping – SWEDEN

This project is a refurbishment intervention. The building was constructed between 1970-1979. It has been refurbished a first time in 1998 and the last time in 2008. Is now used as a shopping mall. The building is used 365 days, 10 hours/day. The area is 17.801 m^2.

The most important actions that have been made are the followings:

1.Installed totally new ventilation system with heat recovery

2.Optimization of the HVAC system

3.Optimization of the operation hours of light

4.Optimization of multi-zone sizing and prohibition of cold & hot mixing

The building is supplied by district heating and cooling. The heated net floor area amounts to 17.801 m^2 (100% of the total surface).The cooled net floor area amounts to 12.460 m^2 (70% of the total surface) After renovation the building energy saving amounted to 26.9%

Registered in 2011

Refurbishment

Type of building:

Commercial

Area:

17.801 m^2

Before refurbishment:

266,6 kWh/m^2yr

Primary energy demand:

194,9 kWh/m^2yr

Energy savings:

26,9%

Investment:

Euro 300.000

Annual savings:

n/a

Aberdeen Property Investors AB

Registered in 2011

Refurbishment

Type of building:

Office

Area:

9.181 m^2

Before refurbishment:

155,0 kWh/m^2yr

Primary energy demand:

95,5 kWh/m^2yr

Energy savings:

38,7%

Investment:

45.000 Euro

Annual savings:

n/a

Kanholds

Sofierogaten 3, 41251 Gothenburg– SWEDEN

The refurbishment intervention of this office building invested only the technical plants. No changes have been made in the envelope or in the size of the building.

It was constructed in 1920 and had a first modernization took place in 1944.

The followings interventions have been made in order to save energy:

- Separated district heating and cooling process (ground source heat pump)
- Improved control system of the heating plant
- Optimization of the HVCA system

Aberdeen Property Investors

Hilton 3

Gustav III Boulevard 40-46, S -16973 Solna – SWEDEN

The property “Hilton 3” consists of 3 buildings and one big underground garage which serves all buildings. In February 2010 a project started with the aim to save energy and to optimize the operation of all HVAC functions at Hilton 3. The work was focused to balance the HVAC system and adjust the operating hours.

The heating source is district heating. The heat is supplied via radiators, fan-coils and ventilation. The cooling system is district cooling and is supplied via cooling beams, fan coils and ventilation. A computerized system operates all main HVAC functions in the building.

The total measured savings until April 2010 was of 1.210 MWh/year.

Registered in 2011

Refurbishment

Type of building:

Office

Area:

17.753 m^2

Before refurbishment:

338,3 kWh/m^2yr

Primary energy demand:

253,42 kWh/m^2yr

Energy savings:

25,1%

Investment:

n/a

Annual savings:

n/a

Aberdeen Property Investors AB

Registered in 2010

Refurbishment

Type of building:

Industrial

Area:

46.208 m^2

Saving after refurbishment:

3.951 MWh/yr

Energy savings:

28%

Investment:

n/a

Annual savings:

n/a

Tobaksmonopolet 2

Maria Skolgata 83, S-118 53, Stockholm - Sweden

This project is a refurbishment intervention. The building was renovated a first time in 1992. This second refurbishment took place in 2008. The property consists of two buildings “Fabriken” and “Magasinet”. Total indoor area is approximately 46.208 m^2, where 24.500 m^2 belongs to “Fabriken” and 21.700 m^2 belongs to “Magasinet”. The heating source is district heating which serves a hydraulic heating system. The heat is supplied via radiators, fan coils and ventilation. The property has two compressor cooling machines for comfort and computer room cooling. The cooling is also supplied via cooling beams, fan coils and ventilation. The ventilation system contains approx. 32 ventilations units. Each unit has an individual heat recuperation system and cooling and heating batteries. A computerized system operates all main HVAC functions in the buildings. The property was able to save 3.951 MWh/year which corresponds to an energy savings of 28%.

Aigües Del Prat. S.A

Seu central d'Aigües Del Prat

Carrer Llobregat, s/n, Illa 0. Barri de Sant Cosme,
08820 El Prat de Llobregat - SPAIN

This project is a new building. The construction started in 2010. Is an office building with laboratories. The area is 2.954 m^2.

Heating, cooling and hot water is produced through a geothermal system: the deepness of the pipes is of 15 meters and the amount of power reached through the system is 100kW. There are two water pump units, having two differentiate cooling circuits with scroll compressors and plates exchangers, actuating as compressors or evaporators depending on the duty cycle. All units are connected to a heating recovery system to avoid energy loses.

Electricity is generated by means of a photovoltaic system. A total of 36kW will be placed on the roof. The energy produced is esteemed to be 47.788 kWh/year.

The lighting System is equipped with presence detectors and timer switches.

Registered in 2011

New building

Type of building:

Office

Area:

2.954 m^2

Reference value:

290,1 kWh/m^2yr

Primary energy demand:

142,5 kWh/m^2yr

Energy savings:

63%

Investment:

n/a

Annual savings:

n/a

Akademiska Hus Norr AB

Registered in 2011

Refurbishment

Type of building:

Office

Area:

8.029 m^2

Before refurbishment:

200,5 kWh/m^2yr

Primary energy demand:

146,8 kWh/m^2yr

Energy savings:

27%

Investment:

n/a

Annual savings:

n/a

Humanisthuset

Umeå- SWEDEN

This project is a refurbishment intervention. The building was constructed in 1972 and has been refurbished between 2005 and 2009. It homes offices and facilities for academic education.

Throughout the years the building has been undergoing series of renovation projects where the main part of the air handling system has been replaced or rebuilt. The original 2-pane windows have been replaced with new more energy efficient ones. The ongoing measures in the building concerns demand controlled air flow in lecture rooms and offices.

The energy use decreased from 200,5 kWh/m^2yr to 146,8 kWh/m^2 yr which gives an energy reduction of 27%.

Generalsanierung Studentenheim der Akademikerhilfe

Pfeilgasse 4-6, A-1080 Wien – AUSTRIA

This project is a refurbishment intervention. The building was constructed in 1931 and has been re-adapted in the 1970s and 1980s.

It was refurbished between 2009 and 2011.The building is use as a residence for students.

Its gross floor area amount to 10.394 m^2 and has 9 floors.

The refurbishment included the following measures: insulation of exterior walls and new windows with high-efficiency, heat recovery from sewage water, partially air ventilation with high-efficiency heat recovery system, interruption of room heating in case of open windows, installation of fire system and upgrade of the facilities in general.

Akademikerhil

Registered in 2011

Refurbishment

Type of building:

Other

Area:

10.392 m^2

Before refurbishment:

157,07 kWh/m^2yr

Primary energy demand:

66,14 kWh/m^2yr

Energy savings:

57,9%

Investment:

n/a

Annual savings:

n/a

Alecta

Newsec Asset Management

Registered in 2010

Refurbishment

Type of building:

Office

Area:

n/a

Before refurbishment:

203,0 kWh/m²yr

Primary energy demand:

105,0 kWh/m²yr

Energy savings:

48,3%

Investment:

n/a

Annual savings:

n/a

Mölndal Krokslätt 20:4

Göteborg, Sweden

Alecta are trustees of pension's funds since 1917.

This building was constructed in 1979 and has 6 floors. The main destination of the construction is for office spaces but at the ground floor also a restaurant and a food shop are located.

During 2005-2009 a comprehensive refurbishment of the property took place. In the majority of the area everything got renovated. Facilities for cooling, heating and ventilation are new. The property is connected to Göteborg energy district heating network. It is ventilated by 12 ventilations system. New sun protection has been mounted on the façades to avoid unwanted solar gains. The energy consumption decreased from 203 kWh/m^2 year to 105 kWh/m^2 year, which gives a reduction of 48%.

Office and Workshop Building Arnold Verladesysteme

Withauweg 9, 70439 Stuttgart - GERMANY

This factory and office building was constructed in 1980. In 2009 a refurbishment intervention was started. The building has 4 floors and a total area of 1.439 m^2.

For heating supply the building is equipped with a ground source heat pump and a ventilation system with heat recovery. New fluorescent light bulbs have been installed and also a day light control system. Special attention has been given to the envelope insulation: for exterior walls a composite system of 24cm is placed. Windows are triple glazed with insulated frames: the U value is 0.8 W/m^2K.The total savings amounts to 429 MWh/year.

Alfred Arnold Verladesystem

Registered in 2010

Refurbishment

Type of building:

Office

Area:

1.439 m^2

Before refurbishment:

380,0 KWh/m^2yr

Primary energy demand:

82,1 KWh/m^2yr

Energy savings:

78,4%

Investment:

n/a

Annual savings:

n/a

Award 2011

ALLCON

Investment Spólka z o.o.

S.K.A

Allcon @ park 3, ul. Slowackiego 173 a, 80-298 Gdansk – Poland.

Ul.Slowackiego 173a, 80-298 Gdansk - Poland

Allcon @ Park 3 is a new office building with a total floor area of 12.969m^2. The building envelope parameters are characterized by U-value lower than demanded by requirements of Polish law. Roof-tops are equipped with heat recovery: rotary air generators in offices and “recuperators” in canteen, heat pumps working in cooling mode with free-cooling. Other energy efficiency measures are: zoning of heating and cooling supplied from VRV system with heat recovery: heat pumps with VRV system used in air curtains at three entrances; heat recovery from sanitary rooms exhaust ventilation; energy efficient lighting. The energy supply is natural gas used in gas heaters in HVAC and in gas boiler.

Registered in 2010

New building

Type of building:

Office

Area:

12.969 m^2

Reference value:

264,8 kWh/m^{2}yr

Primary energy demand:

196,0 kWh/m^{2}yr

Energy savings:

25,7%

Investment:

n/a

Annual savings:

n/a

AMI

GmbH

Bürogebäude Goebenstrasse (GOE 1)

Goebenstrasse 1, 50672 Koln – GERMANY

This project concerns an office building for a French Insurance Company: Central Cologne.

The building is used 300 days/year, 12 hours/day. The area is 5.744 m^2.

Besides keeping modern comfort standards during the planning process, high attention was put on reaching ecological and economical lasting energetic standards. The room's heating and cooling is realized by concrete floor activation. The concrete floor is supplied with heat energy by a heat pump connected to a ground water pumping system. During cooling, ground water is used directly by means of a heat exchanger. The building has a central-air-handling-unit with a heat recovery. The radiators and the air-handling-unit are connected to the local district heating. The envelope U-value ($W/m^2/K$) is 0.492.The heated net floor area amounts to 5.744 m^2 .The cooled net floor area amounts to 4.919 m^2.

Registered in 2011

New building

Type of building:

Office

Area:

5.744 m^2

Reference value:

160,9 kWh/m^2yr

Primary energy demand:

91,1 kWh/m^2yr

Energy savings:

43,4%

Investment:

n/a

Annual savings:

n/a

Architektbüro Knetemann & Partner

Registered in 2010

Refurbishment

Type of building:

Office

Area:

1.021 m^2

Before refurbishment:

698,00 kWh/m^2yr

Primary energy demand:

306,47 kWh/m^2yr

Energy savings:

56,1%

Investment:

n/a

Annual savings:

n/a

Office Building Zeughausstrasse 70

Zeughausstrasse 70-72, 26121 Oldenburg- Germany

This office building was built between 1970 and 1979. It has been refurbished in 2010.The building area is of 1.021 m^2. It is used 250 days/years for 9 hours/day.

Its heating supply comes from a combined gas-oil boiler. The radiators of the heating system are equipped with thermostatic valves. Selective glazing is used in order to reduce solar heat gains in summer. Night-drawdown and week-end-drawdown are foreseen. Fluorescent lamps have replaced incandescent ones. The insulation of the opaque building envelope has been improved (U value: 0.45 W/m^2/K).The building is equipped with a photovoltaic plant. The energy consumption has been reduced from 698 kWh/m^2 year to 306.47 kWh/m^2 year, which gives an energy saving percentage of 56.1%.

Kindertagesstätte “ Die Sprösslinge”

Alfred-Nobel-Strasse 60, 40789 Monheim - Germany

The company crèche is a zero emission building for 60 children using among others well dimensioned heating pumps with power regulation, a solar thermal plant and PV, high efficient luminaries, improved insulation of the envelope, detailed calculations to avoid thermal bridges.

The total energy saving, according to German legal standards of reference, amounts to 96 MWh/year.

Bayer Real Estate GmbH

Registered in 2010

New Building

Type of building:

Educational

Area:

1.064 m^2

Reference value:

133,60 kWh/m^2yr

Primary energy demand:

43,13 kWh/m^2yr

Energy savings:

67,7%

Investment:

n/a

Annual savings:

n/a

Award 2011

Bürohaus Schwabenhof Gbr

Registered in 2011

New Building

Type of building:

Office

Area:

763 m^2

Reference value:

108,7 kWh/m^2yr

Primary energy demand:

69,7 kWh/m^2yr

Energy savings:

35,9%

Investment:

557.000 euro

Annual savings:

n/a

"Office Building Schwabenhof"

Ferdinand-Braun-Str. 8, 74076 Heilbronn – Germany

This project is a new building. The construction started in 2010.

The building is used 315 day/year, 8 hours/day.

The area is 763 m^2.

The envelope U value (W/m^2/k) is 0,284.The heating is supplied with an electrical heat pump; the cooling production system is connected with a ground source heat pump. A solar thermal plant (hot water collector with selective glazing) and a photovoltaic plant are also installed.

After renovation the building energy saving amounted to 38% (EnEV 2009 – Reference value in Germany).

Chalmersfastighet AB

CHALMERSFASTIGHETER

Vasa Hus 15

Göteborg, Sweden

This intervention is a refurbishment of an office building. The original one was built in 1960. The building is a five floor office building that also includes a dental practice and a medical centre. It is situated in Gothenburg and has a heated area of 5.930 m^2.

The intervention was divided in two stages: the first stage, floor 1-3, started in June 2010, involved the replacement of seven intake air units and seven exhaust air units which serve floors 1-3. The company will also examine and optimize the air volumes and install windows with solar protection. The second stage, floor 4-5, commencing in June 2011, involves the replacement of six ventilation units with two units with lower electricity consumption and greater efficiency.

Registered in 2010

Refurbishment

Type of building:

Office

Area:

5.930 m^2

Before refurbishment:

131,00 kWh/m^2yr

Primary energy demand:

93,00 kWh/m^2yr

Energy savings:

29%

Investment:

n/a

Annual savings:

n/a

City of Ludwigshafen

Registered in 2010

Refurbishment

Type of building:

Cultural

Area:

6.811 m^2

Before refurbishment:

348,9 kWh/m^2yr

Primary energy demand:

117,00 kWh/m^2yr

Energy savings:

66,5%

Investment:

n/a

Annual savings:

n/a

Wilhelm-Hack-Museum

Berliner Str.23, 67059 Ludwigshafe, Germany.

This Green Building project is a refurbishment intervention which took place in the years 2007-2009.

It is a 4 floor building with a net floor surface of 6.811 m^2.

It is supplied with a district system both for heating and cooling. The ventilation system is with heat recovery (•70% efficiency) and moisture exchange. The system is equipped with evaporation humidifier with adiabatic cooling flow-control valve. The lighting system is equipped with T5 fluorescent light bulbs with ballasts individually dimmable. A daylight control is installed.

Windows are double pane with insulated frames (U_w = 1,1 W/ m^2a) and light screens. Venetian blinds are controlled by light sensors.

The insulation of the building envelope is a thermal composite system: 14-16 cm mineral wool (U = 0,21 W/ m^2a). The north-west part of the roof has a thermal insulation composite system; the south west part is equipped with photovoltaic modules.

COMPACTHAB

Residence Hall in Campus Montilivi II, Girona Univeristy

C/Estudi General de Girona, s/n. Campus Montilivi II17003 Girona, Spain.

These two new residence building are located inside Montilivi Campus, which was born in the 90's. The residence hall is formed by two independent buildings divided up in four different floors. There are a total of 70 apartments available and capacity for 100 people. Total surface is almost 3.500 m^2. These building gather several services apart from apartments as offices, laundry room, gym, etc. The buildings are supplied by a micro-cogeneration system with a thermal power of 12,5 kW, performing 62% thermal and 39% electrical conversion. Centralized hot water provided by this system is connected to an integrated management system that supplies hot water to each apartment using a unique distribution ring. Orientation is well exploited in order to reduce consumption; free cooling and cross ventilation are also used. Insulation of the envelope is provided. Particular attention has been given to the life cycle of all materials utilized in the constructions.

Registered in 2010

New Building

Type of building:

Educational

Area:

3.500 m^2

Reference value:

292,00 kWh/m^2yr

Primary energy demand:

93,7 kWh/m^2yr

Energy savings:

68%

Investment:

n/a

Annual savings:

n/a

CONSELL GENERAL D'ANDORRA

Registered in 2011

New Building

Type of building:

Institutional

Area:

5.117 m^2

Reference value:

298,19 kWh/m^2yr

Primary energy demand:

91,1 kWh/m^2yr

Energy savings:

64,9%

Investment:

433.564 euro

Annual savings:

n/a

Edifici del M.I Consell General d'Andorra

C. de la Vall 28, AD500, Andorra la Vella, Andorra.

This project is for the new building of the Andorran Parliament and its administrative offices. This building wants to be an example as energy efficient building.

The envelope U value is of 0.67 W/m^2/K. The type of heating production system is a combined gas-oil boiler. For cooling a centralized mechanical plant is provided. The type of cooling production system is an air-water heat pump. Both night-drawn down and week-end draw down system control have been installed. The building is equipped also with heating recovery system for ventilation.

Fluorescent lamps have replaced the normal incandescent lamps. Occupancy linking control and time scheduling controls have been installed.

The building is also supplied by a photovoltaic plant with a nominal efficiency of 13.6% and an absorbing area of 285,3 m^2. The primary energy generated by the plant is 21.229 kWh/year.

Residence Hall ETSAV Campus

Manresa, Spain

The residence hall is formed by one building divided up in 2 floors. There is a total of 57 apartments available and capacity for 86 people. Total surface is almost 2.900 m^2. It consists in a modular construction, which ensures a sustainable life cycle with the possibility of deconstruction instead of demolition.

The building is equipped with a micro cogeneration system. The energy produced with this system amounts to 9.715 kWh/year. The hot water provided by this system is connected to an integrated management system that provides hot water to each apartment using a unique hot water distribution ring. Each apartment has a small substation connected to the hot primary circuit. Each substation includes a measurement system which facilitates consumption control and management.

The building is made by using concrete slab insulation, basically based on extruded polystyrene and rock wall that ensures a high level of insulation from the soil. Also window's glazing has its particularities. On facades, glazing composition consists of an outside 6 mm glass, 12 mm of air chamber and finally a double glass (6 mm each). Thermal conductivity has a value of 1,8 W/m^2K and a solar factor of 0,53.

Constructora D'Aro

Registered in 2011

New Building

Type of building:

Educational

Area:

2.900 m^2

Reference value:

298,1 kWh/m^2yr

Primary energy demand:

91,1 kWh/m^2yr

Energy savings:

69,4 %

Investment:

n/a

Annual savings:

n/a

Award 2012

Corem Property Group AB

Registered in 2011

Refurbishment

Type of building:

Office

Area:

10.825 m^2

Before refurbishment:

122,2 kWh/m^2yr

Primary energy demand:

61,1 kWh/m^2yr

Energy savings:

50%

Investment:

n/a

Annual savings:

n/a

Award 2012

Lastkajen 3 10

Stockholm, Sweden

The project is a refurbishment intervention.

The building was constructed in the 1940s as a reception of railway goods.

The building was been refurbished between 2009 and 2010.

Is an office building with a total area of 10.825 m^2.

The old oil-heating system has been replaced by a geothermal heat plant combined with a heat pump. In the ground next to the building, twenty drill holes will be able to supply heat during wintertime and cool during summer months.

The energy used decreased from 122,2 kWh/m^2 year to 61,1 kWh/m^2 year, which gives an energy reduction of 50%.

American Heart Institute

Nicosia, Cyprus

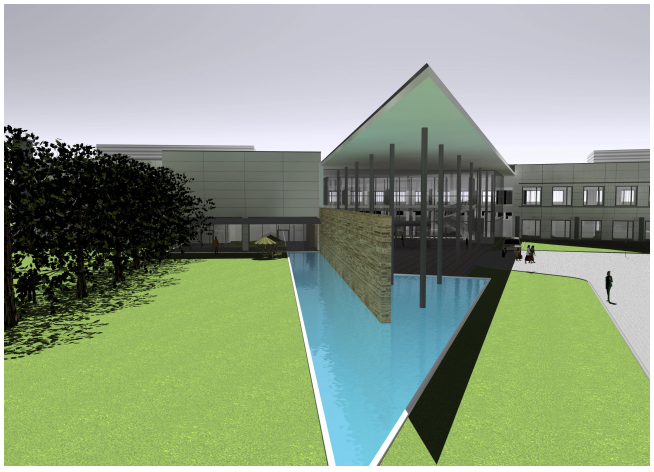
This Institute is a newly built green private hospital, which from the start was envisaged to utilize state of the art technologies in both the medical and building sector. Its technical system includes, among other, a 100KWp photovoltaic system, geothermal heating and cooling system, highly efficient lighting system and a central Building Management System.

The main building has an area of 13.400 m^2.

Daylight has been taken in strong consideration, both for the comfort of the patients and for energy saving. All windows are equipped with either outside solar guided vertical blinds or internal shading. The overall U value of the building is 0.51.

For the lighting system, low energy fluorescent bulbs with electronic ballasts, LEDs and halogen lights were used.

Due to the hot and dry weather in Cyprus, cooling during the extensive summer months is the main problem to solve. It has been calculated that 350 MWh/yr will be saved just using the ground temperature to precondition all fresh air entering the building.



C & SO Medical Properties LTD.

Registered in 2010

New Building

Type of building:

Health

Area:

13.400 m^2

Before refurbishment:

1.200 MWh/yr

Primary energy demand:

850 MWh/yr

Energy savings:

54,4%

Investment:

n/a

Annual savings:

n/a

Award 2011